

Application No. 10/675,374  
Amendment Dated March 19, 2007

125640-1

### Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the Application:

### Listing of Claims:

#### Claims 1-16 (Canceled)

17. (Previously Presented) An investment casting core fabricated by the process of Claim 34.

18. (Previously Presented) The process of Claim 34, wherein the silicone monomers and/or oligomers contain an alkenyl functionality of formula:

$$\begin{array}{c} \text{R}^1 \\ | \\ -\text{Si}-\text{X}_a-\text{C}=\text{C}- \\ | \quad \quad | \\ \quad \quad \text{R}^2 \\ \quad \quad \text{R}^3 \end{array}$$
 wherein  $\text{R}^1$ ,  $\text{R}^2$ , and  $\text{R}^3$  each independently comprise hydrogen or a monovalent hydrocarbon radical, X a divalent hydrocarbon radical and a is 0 or 1, and a hydride functionality consisting of silicon-hydrogen bonds;

19. (Previously Presented) The process according to Claim 34, wherein the combination of the ceramic powder with the silicone monomers and/or oligomers is carried out in the absence of solvent.

20. (Previously Presented) The process according to Claim 34, wherein combining the ceramic powder with the silicone monomers and/or oligomers first comprises mixing the ceramic powder with a dispersant.

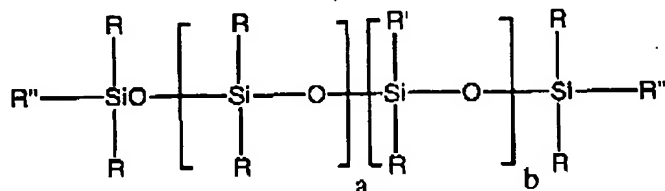
Application No. 10/675,374  
Amendment Dated March 19, 2007

125640-1

21. (Previously Presented) The process according to Claim 34, wherein cross linking and/or polymerizing the silicone monomers and/or oligomers to form the core comprises heating the ceramic slurry to an elevated temperature.

22. (Previously Presented) The process according to Claim 34, wherein the silicone monomers and/or oligomers containing the alkenyl functional group are selected from the group consisting of:

polyfunctional siloxanes of formula:



wherein R is a monovalent hydrocarbon, R' is an alkenyl radical, R'' is a monovalent hydrocarbon or an alkenyl radical,  $a = 0$  to 20, inclusive, and  $b = 1$  to 80, inclusive, wherein  $a$  and  $b$  are selected to provide a fluid with a maximum viscosity of 1,000 centistokes,

a cyclic alkyl/alkenyl siloxane of formula:

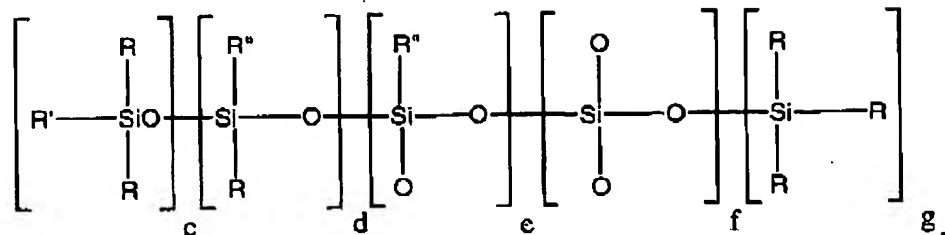


wherein R and R' are as previously defined, and  $x$  is an integer 3 to 18 inclusive;

an unsaturated siloxane of formula:

Application No. 10/675,374  
Amendment Dated March 19, 2007

125640-1

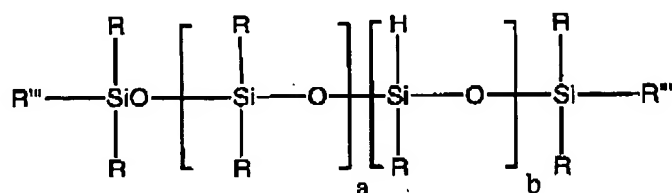


wherein R, R', and R'' are as previously defined. Preferably, the ratio of the sum of (c+d+e+g)/f is  $\geq 2$ ;

and mixtures thereof.

23. (Previously Presented) The process according to Claim 34, wherein the silicone monomers and/or oligomers containing the hydride functional group are selected from the group consisting of:

a polyfunctional hydride siloxane of formula:



wherein R is a monovalent hydrocarbon, R''' is a monovalent hydrocarbon or hydrogen, and a and b a = 0 to 20, inclusive, and b = 1 to 80, inclusive, wherein a and b are selected to provide a fluid with maximum viscosity of 1,000 centistokes,

an alkyl/hydride cyclosiloxane of formula:

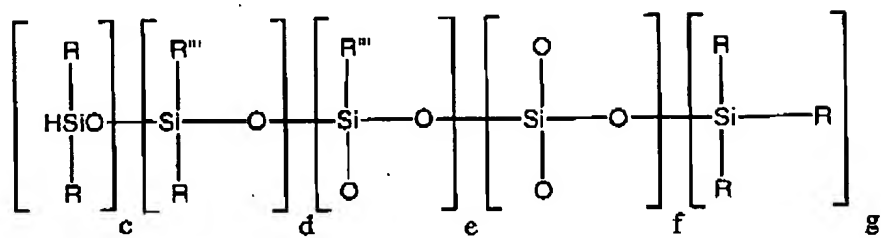
Application No. 10/675,374  
Amendment Dated March 19, 2007

125640-1



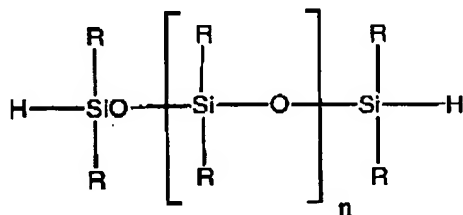
wherein x is an integer 3 to 18 inclusive,

a functional hydride siloxane of formula:



wherein a ratio of the sum of (c+d+e+g)/f is  $\geq 2$ ,

a terminal hydride siloxane of formula:



wherein n = 0 to 100, and

mixtures thereof.

Application No. 10/675,374  
Amendment Dated March 19, 2007

125640-1

24. (Previously Presented) The process according to Claim 34, wherein the catalyst comprises a platinum group metal catalyst.

25. (Canceled)

26. (Previously Presented) The process according to Claim 34, wherein the silicone monomers and/or oligomers containing the alkenyl functional group are selected from the group consisting of 1,3-divinyl-tetramethyldisiloxane, hexavinylsiloxane, 1,3-divinyldiphenyldisiloxane, 1,1,3-trivinyltrimethyldisiloxane, 1,3-tetravinyltrimethyldisiloxane, 1,3,5-trivinyl-1,3,5-trimethylcyclotrisiloxane, 1,3,5,7-tetravinyl-1,3,5,7-tetramethylcyclotetrasiloxane, 1,3-divinyloctaphenylcyclopentasiloxane, and mixtures thereof.

27. (Previously Presented) The process according to Claim 34, wherein the silicone monomers and/or oligomers containing the hydride functional group are selected from the group consisting of poly(methylhydrogen)siloxane, poly[(methylhydrogen)-co-(dimethyl)]siloxane; 1,3,5,7-tetramethylcyclotetrasiloxane, 1,3,5,7,9-decamethylcyclopentasiloxane, cyclic methylhydrogen siloxanes; tetrakis(dimethylsiloxy)silane, hydridodimethylsiloxy silicate  $[\text{HSi}(\text{CH}_3)_2\text{O}_{1/2}]_2(\text{SiO}_2)$ , and mixtures thereof.

Claims 28-33. (Canceled)

Claim 34. (Currently Amended) A process for the formation of a ceramic core, comprising the following steps:

Application No. 10/675,374  
Amendment Dated March 19, 2007

125640-1

(a) combining a ceramic powder with silicone monomers and/or oligomers, to form a ceramic slurry which comprises having a viscosity of about 1 to about 1,000 centistokes, and comprising an uncured silicone matrix; wherein the silicone monomers and/or oligomers have a viscosity of about 1 to about 1,000 centistokes, and comprise at least three alkenyl-reactive functional groups or at least three hydride-reactive functional groups per mole of monomer or oligomer;

(b) adding a metallic catalyst to the slurry;

(c) transferring the slurry to a core mold or core die;

(d) cross-linking and/or polymerizing the silicone monomers and/or oligomers to form a green product in the shape of the desired core; and

(e) heating the green product to a temperature effective to decompose the cross-linked and/or polymerized silicone monomers and/or oligomers, and to form a ceramic core which contains a silica char, wherein the ceramic core is in the shape of at least one internal cavity of a turbine component.

Claim 35. (Canceled)

Claim 36. (Currently Amended) The process of Claim 35 ~~41~~,  
wherein the metallic material comprises a superalloy.

Claim 37. (Canceled)

Application No. 10/675,374  
Amendment Dated March 19, 2007

125640-1

**Claim 38. (Previously Presented)** The process of Claim 34, wherein at least one solvent is combined with the ceramic powder and silicone monomers and/or oligomers in step (a).

**Claim 39. (Previously Presented)** The process of Claim 38, wherein the green product is dried after step (d), to remove substantially all of the solvent and form a plurality of pores within the green product.

**Claim 40. (Previously Presented)** The process of Claim 38, wherein the green product is dried during step (d), to remove substantially all of the solvent and form a plurality of pores within the green product.

**Claim 41. (New)** A process for the formation of a turbine component, comprising the following steps:

- (a) combining a ceramic powder with silicone monomers and/or oligomers, to form a ceramic slurry which comprises an uncured silicone matrix; wherein the silicone monomers and/or oligomers have a viscosity of about 1 to about 1,000 centistokes, and comprise at least three alkenyl-reactive functional groups or at least three hydride-reactive functional groups per mole of monomer or oligomer;
- (b) adding a metallic catalyst to the slurry;
- (c) transferring the slurry to a core mold or core die;

Application No. 10/675,374  
Amendment Dated March 19, 2007

125640-1

(d) cross-linking and/or polymerizing the silicone monomers and/or oligomers to form a green product in the shape of the desired core; wherein the core is in the shape of at least one internal cavity pre-selected for the turbine component;

(e) heating the green product to a temperature effective to decompose the cross-linked and/or polymerized silicone monomers and/or oligomers, and to form a ceramic core which contains a silica char;

(f) disposing the core formed in step (e) within a mold for a turbine component;

(g) introducing a turbine component-forming, molten metallic material into the mold, wherein the core is positioned in a location suitable for the formation of the desired internal cavity within the turbine component;

(h) solidifying the molten metallic material in the shape of the turbine component; and

(i) removing the core from the turbine component and separating the component from the mold.